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purpose the volume would be of far greater service if the reading lists contained reference to other than English works.

As to the maps—there are twenty of them in all—some are well suited to the end desired, though only sketch maps. Others, such as that showing the mineral production in South America (opp. p. 244) are worse than useless. Tin is shown as a product of northeastern Bolivia, the low rubber country of the Amazon. No petroleum is ascribed either to Peru or Argentina, nor is coal given among the minerals of Chile. The railway map opposite page 244 would lead one to suppose that there was no possibility of going by rail from Buenos Aires to either Asunción or Rio de Janeiro, while the line shown as skirting the western shore of Lake Titicaca exists only as one of the numerous *proyectos* that cover the continent.

Errors in statements, too, occur. Tacna and Arica were not lost by Bolivia but by Peru (see p. 187). The sovereignty of the vast Loreto region on the headwaters of the Amazon still remains undecided (see p. 185).

In spite of such faults this work should be of real and permanent value to students of Latin America.

A TOPOGRAPHICAL SURVEY OF THE ACONCAGUA REGION OF THE ANDES

ROBERT HELBLING. **Beiträge zur topographischen Erschliessung der Cordilleras de los Andes zwischen Aconcagua und Tupungato.** 77 pp.; maps, ills. *Jahresbericht Akad. Alpenclub Zürich,* Vol. 23, 1918.

Dr. Robert Helbling of Flums, Switzerland, the author of this exceptionally valuable cartographic study, intended to prepare a large volume on the mountain journeys that he made in the Argentine-Chilean Andes, chiefly in company with Dr. F. Reichert, between 1906 and 1912, concerning which Reichert has already published several articles; but, the war intervening, the present fraction of the total is published with the expectation of bringing out the remainder later. Both text and maps are manifestly the work of a well-trained and experienced topographer and mountaineer, such as Switzerland may well take pride in producing.

The first section of the essay (pp. 5–8) gives a geographical summary of a 70-mile stretch of the Andes between Aconcagua, 7,010 meters, in latitude 32½° S. and Tupungato, 6,650 meters, in latitude 33½° S. Near the former mountain is the Uspallata Pass, 3,799 meters, crossed by Charles Darwin and by Jeffries Wyman, 85 and 60 years ago respectively, and now tunneled by the Transandine Railway. The second section (pp. 9–22) treats the previous mapping of the district and corrects certain statements to the effect that only small cirque-glaciers exist in this part of the range by the announcement that large and long valley-glaciers of true Alpine type occur. A third section (pp. 23–27) describes the author's topographic surveys, made by the "stereophotogrammetric" method, at the cost of the Transandine Railway and of the South American Hotels Company, supplemented by personal funds. The resulting maps, as far as published, are described below. Notes on the geology, physiography, and glaciation occupy a fourth section (pp. 28–46): Tupungato is here described as a lofty volcano, its summit seeming to be a broken or dissected crater rim, while several lava flows descend its flanks. Aconcagua, although long reputed to be a volcano, is surely not so, as several earlier explorers have pointed out; it is the eroded remainder of an overthrust mass, chiefly composed of hornblende porphyry. About midway between these two lofty summits is a group of mountains dominated by the Juncal, 6,110 meters, also not a volcano, although consisting largely of volcanic rocks which have been uplifted and dissected into their present form. Here are the largest glaciers of the area under consideration; the longest of them, the Ventisquero del Plomo, is the trunk of a complex glacial system; it is illustrated by several half-tone views in the text and measures 17 kilometers from its snow crests at 5,000 meters to its end at 3,165 meters.

In general the mountainous highlands show maturely dissected or subdued forms ("Die Formen . . . . entsprechen einem reif zerschnittenen, z. T. sogar unterjochten Bergland"), in which, after upheaval had introduced a new cycle of erosion, deep and mature trough valleys have been eroded, heading in glacial cirques; but the rounded forms of the lofty highlands, true "Mittelgebirgsformen" in spite of their height and of interruptions here and there by unsubdued cliffs, still prevail between the deep valleys; and the cirques, large as they are, appear only as niches excavated in the mature domes of the earlier cycle. Lateral valleys are said to hang above the main valleys, but the author does not take sides for or against glacial erosion as a cause of their hanging, although he mentions the former greater expansion of the glaciers as indicated by the occurrence of glacial striae at an altitude of about 3,000 meters, 20 kilometers down valley from the present end of the Plomo glacier. The dry climate supports few streams, and the heavy mountain masses are therefore little subdivided between the main valleys. Rapid weathering of relatively weak rocks has cloaked the mountain sides with long slopes of detritus. The main valleys show neither rock steps causing rapids or falls, nor rock basins holding lakes, but are heavily aggraded with rock waste swept down by their braided streams and therefore present an equalized descent. Vegetation is scanty and animal life is rare; except near the railway, no signs of human occupation are to be seen. Thus the Andes here contrast strongly with the Alps. They lack the enlivening alternation of bold peaks, bare cliffs, and brilliant snow fields, of forest, pasture, and field; the surface is largely stony and sterile, without splashing streams and whitened cascades. No human settlement or trace of human activity is visible, although wretched, forsaken herds are occasionally met. The unconcealed natural colors of the bare rocks unite in manifold and quite improbable combinations, which with the simple outlines of huge mountains, their untouched isolation, and complete silence, constitute views of magnificent and restful beauty.

A sixth section (pp. 46–77) is devoted to Alpinism, for which the region is highly recommended. A list of all important ascents since 1882 is here compiled. It may be noted that a good hotel is now established at the Puente del Inca, 2,850 meters, 25 kilometers east of the Uspallata tunnel, where camping equipment, mules, and guides can be hired. An 18-page supplement on the height of Aconcagua is bound in with the reprint of the main article. This great mountain is given an altitude of 7,010 ± 32 meters and th~~us~~ ranks as the highest of all American summits.

The five maps that accompany the essay are the product of the map-engraving establishment "Kartographia Winterthur." One is a general map compiled from various sources on a scale of 1:250,000, extending somewhat north and south of the stretch of the range that Helbling especially studied. The four other maps are large sheets reproduced on a scale of 1:25,000 from originals of the same scale by the author; three of them represent a district measuring about 30 by 15 kilometers around the Juncal with its many large glaciers, presumably the center of touristic interest; while the fifth map represents the southwestern side of Tupungato, with its glaciers, and shows the author's path of ascent to the summit. These maps are of exceptional interest, being much more detailed than any previously published. The mountains are tinted in brown, with sketched brown contour lines of 25 meters interval on the smoother slopes, and brown hachures for the more abrupt forms. Snow and ice are contoured in blue, with a light-blue tint on their steeper parts, and with appropriate indication of crevasses and moraines. As the mountains and glaciers are rarely named, Helbling added several new names to the few that he found in local use to aid his descriptions; all are given in Spanish. Maps and text alike should prove indispensable to future explorers of the seldom visited Juncal group. W. M. Davis